

# RETROSPECTIVE ANALYSIS OF A 5-WEEK SUMMER SPORTS PROGRAM INDICATES HEALTH IMPROVEMENTS IN 9-16 YEAR OLDS



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## INTRODUCTION

- During the past 3 decades, prevalence rates of childhood and adolescent obesity (which is defined as body mass index (BMI) above the 95th percentile for age and sex) have more than doubled in the United States<sup>1</sup>
- The United States Department of Health and Human Services (USDHHS) recommends 60 or more minutes of physical activity per day.<sup>2</sup> Studies have suggested that children are more prone to remain sedentary during the summer months due to lack of supervision <sup>3</sup>that they would normally receive at home or in school.
- Summer camp programs are a viable opportunity for physical activity promotion. <sup>4</sup>Camps also introduces children to new forms of physical activity that they can continue to follow with the conclusion of the camp.
- Obesity is a risk factor for cardiovascular diseases such as hypertension that can lead to greater all-cause mortality and increases in physical activity can reduce blood pressure in adults. <sup>1</sup>
- Thus, the purpose was to determine impact of 5 week summer camp on overall improvements in the anthropometric and cardiovascular health in participants ages 9-16 years old.

## METHODS

### Subjects

- Data were collected at the National Youth Sports Program hosted by Case Western Reserve Univ. in 2013. (n=217)
- Table 1:** Prior collected<sup>6</sup> demographics from June 2013-July 2013.
- Majority of the campers reside in the city of Cleveland

### Camp Structure

- 5 weeks, Monday-Friday, 5.5 hours per day
  - Athletics: basketball, baseball, swimming, football, track and field, volleyball, and badminton
  - Educational activities including: art, law and debate, nutrition, safety, and computer education during the camp.
- Fit walk
  - Campers walked between campus locations
  - ~1.1 miles each day **Fig. 1:** CWRU campus map.

### Data Collection

- Measurements were taken on registration and at the end of 5 week camp
- Trained staff
  - 3rd and 4th year medical students, senior year nursing students, NYSP staff
- Height and weight data
  - Calculation of BMI as weight/height<sup>2</sup>
- Systolic and Diastolic Blood Pressure
  - Calculation of Mean Arterial Pressure as  $DP + 1/3(SP-DP)$
- Statistics
  - Independent student t-test
  - P<0.05

## DEMOGRAPHICS

Subject Characteristics			1
% Total (n=545)			
Gender	Male	58.5	
	Female	41.5	
Age	9 to 11	37%	
	12 to 13	59.60%	
	14-16	13%	
Race/Ethnicity	Black/African American	93.2	
	White/Caucasian	4.5	
	Hispanic/Latino	1.4	
	Mixed Race and/or another race	1.0	
Table: 1-Demographics			

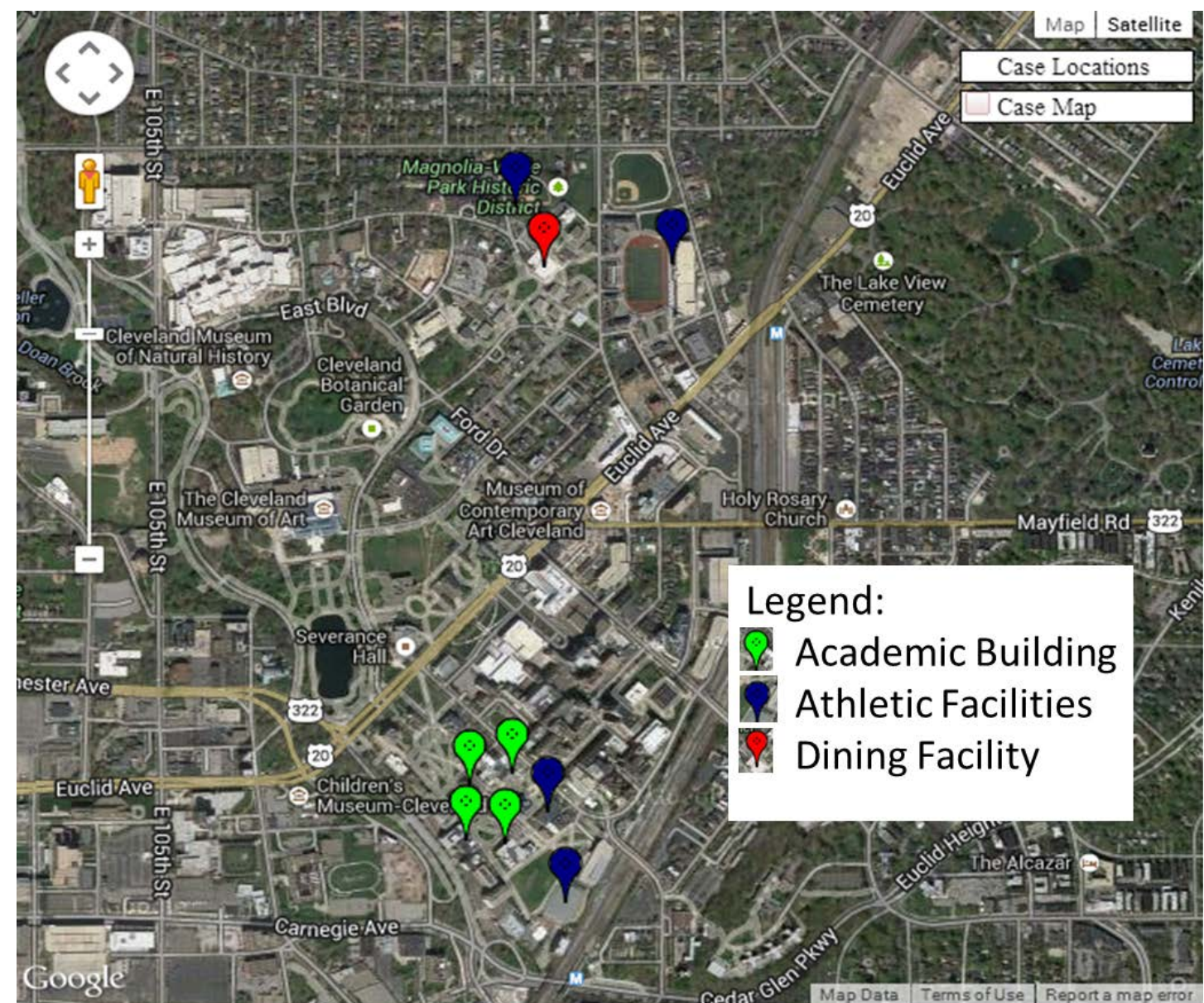
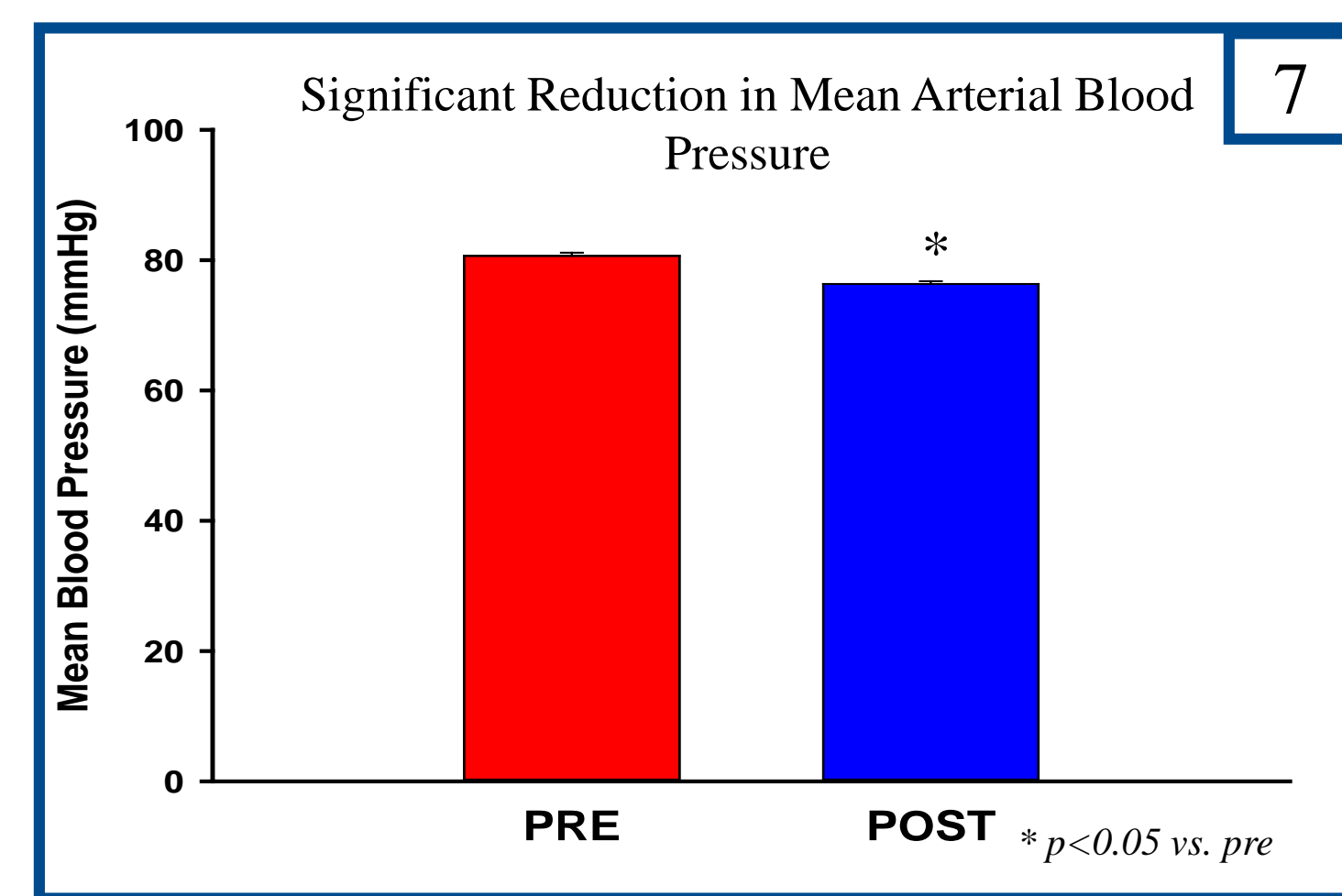
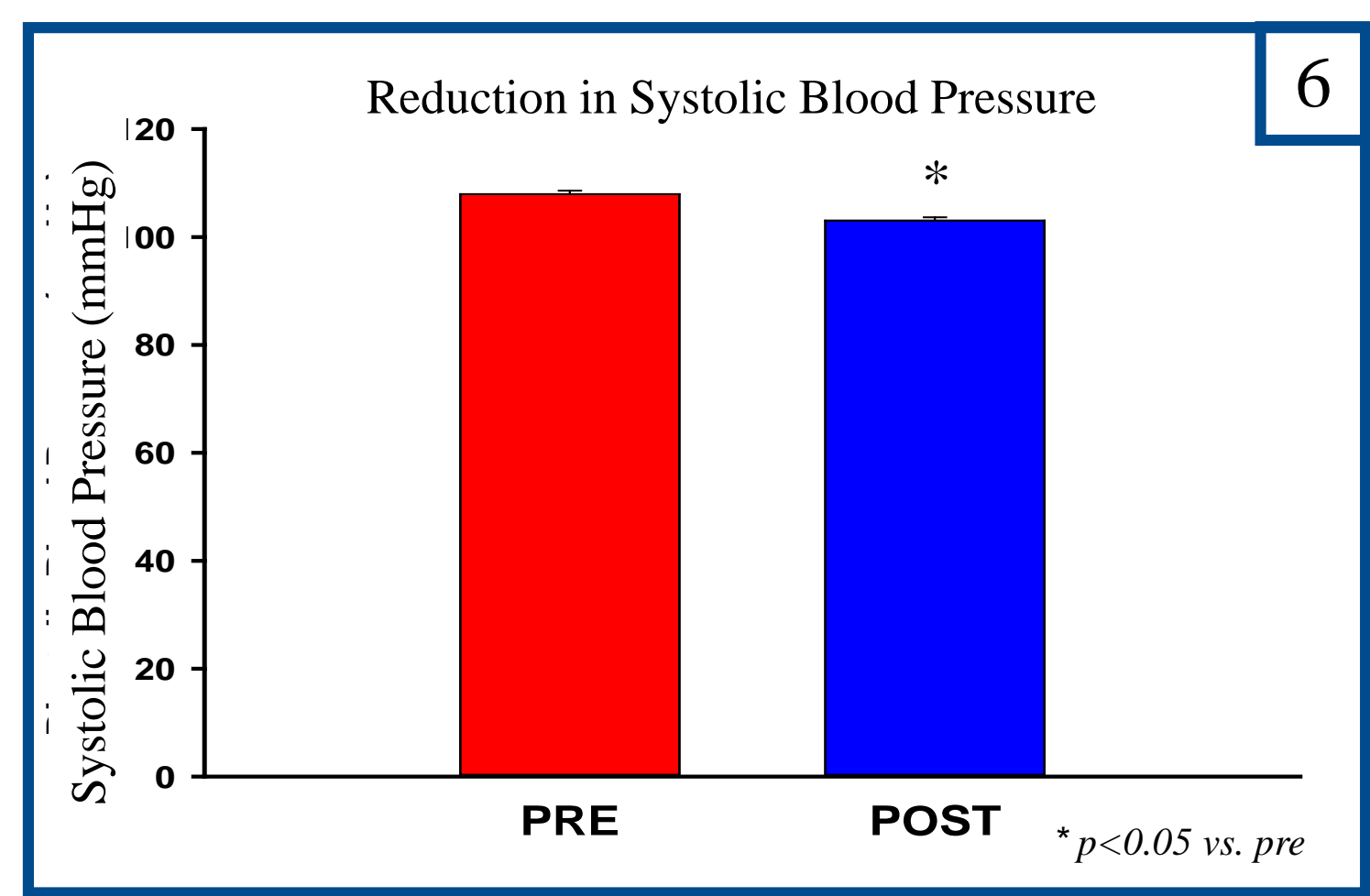
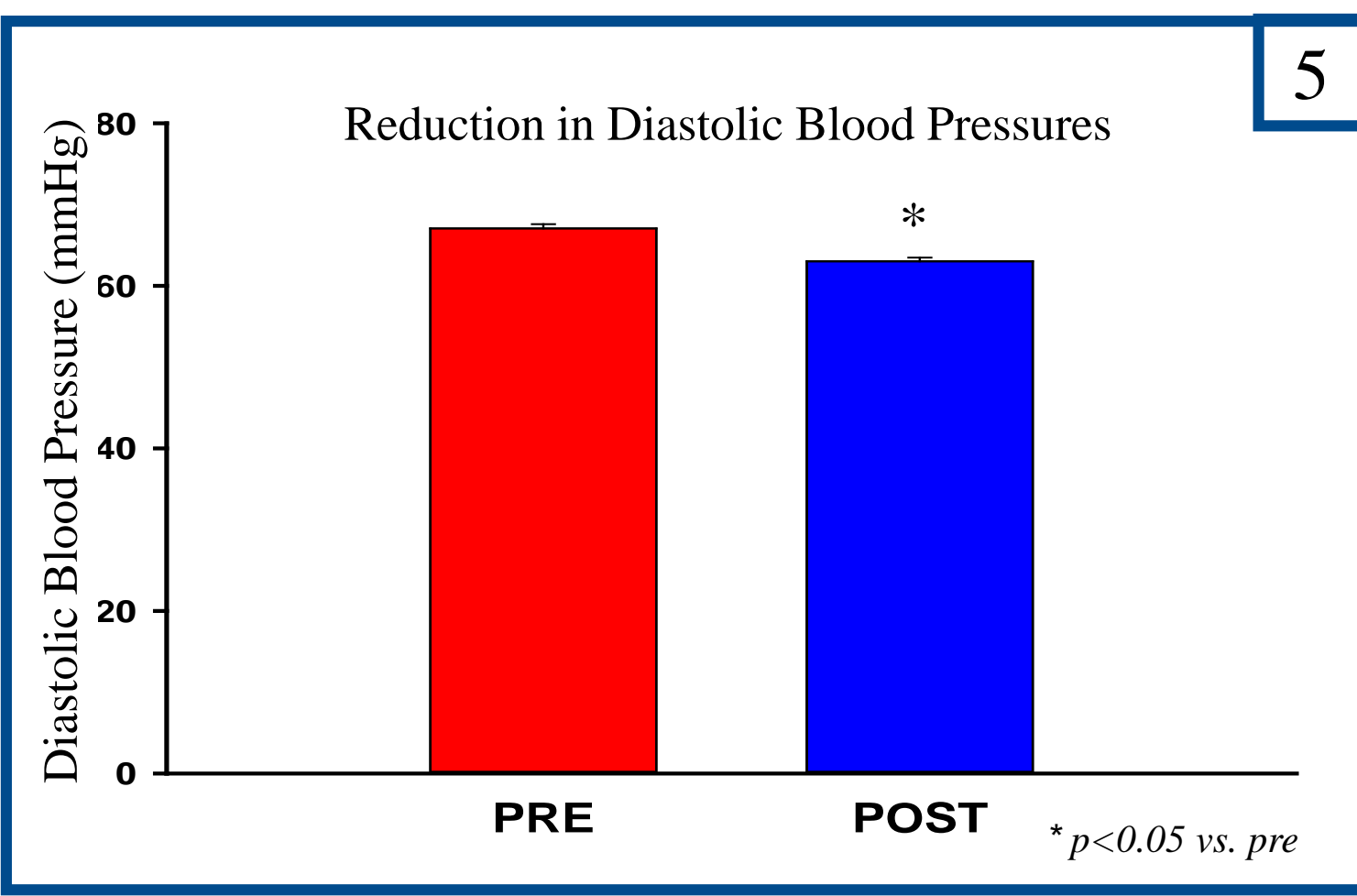
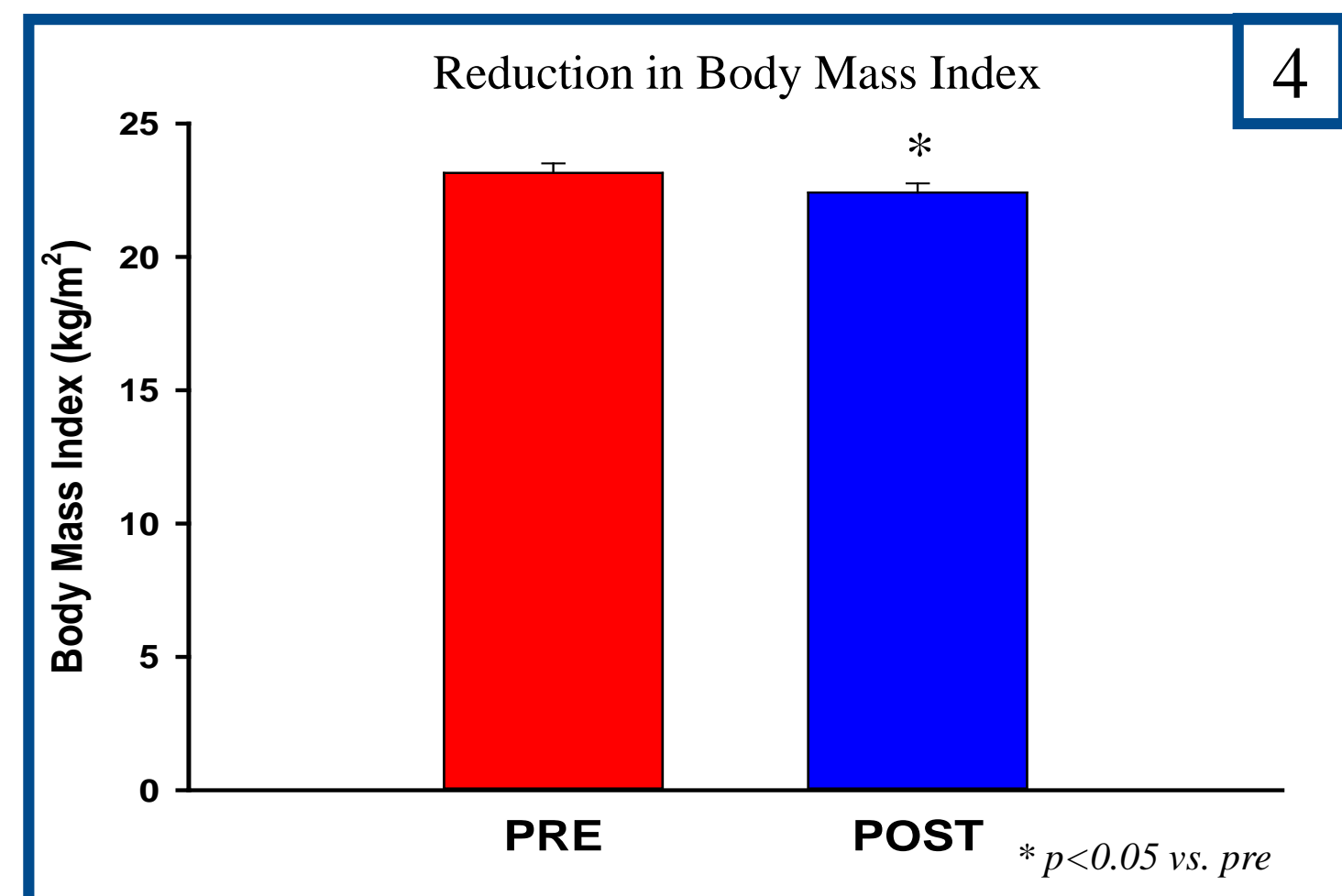
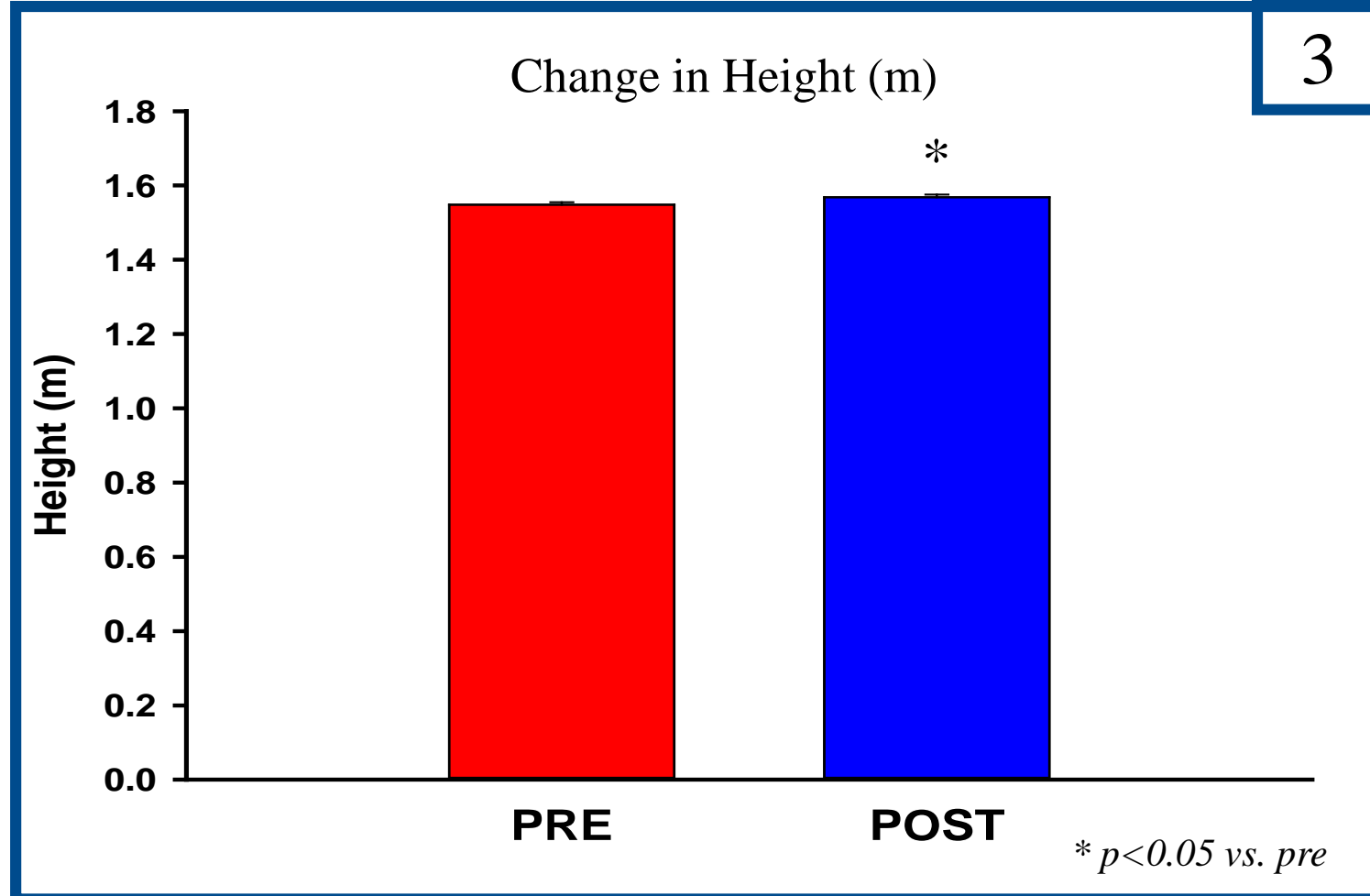
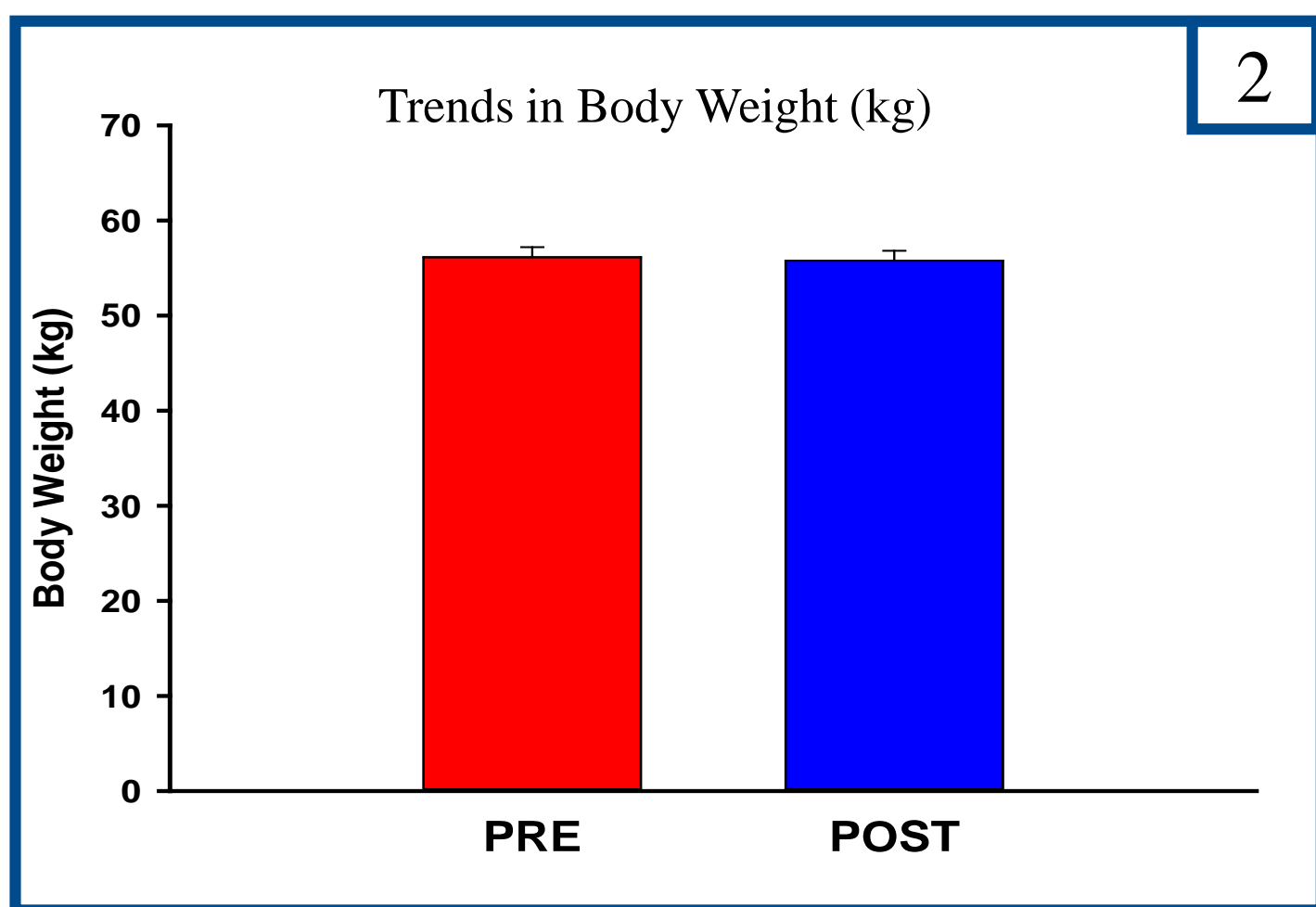


Figure: 1 CWRU-NYSP campus map

## RESULTS



## CONCLUSIONS

- 36% of the sample of participants in NYSP were considered obese at the start of the camp. (n=98, n=271).
- BMI was significantly reduced ( $23.2 \pm 0.4 \text{ kg/m}^2$  vs  $22.4 \pm 0.3 \text{ kg/m}^2$ ;  $p<0.05$ ) due to increases in height ( $1.55 \pm 0.007 \text{ m}$  vs  $1.57 \pm 0.007 \text{ m}$ ;  $p<0.05$ ) and a trend towards decreased body weight ( $56.1 \pm 1.1 \text{ kg}$  vs  $55.8 \pm 1.0 \text{ kg}$ ;  $p=0.07$ ). Fig. 2-4
- Mean arterial pressure was significantly reduced due to lowered systolic blood pressure ( $107.9 \pm 0.7 \text{ mmHg}$  vs  $103.1 \pm 0.6 \text{ mmHg}$ ;  $p<0.05$ ) and lowered diastolic blood pressure ( $67.0 \pm 0.7 \text{ mmHg}$  vs  $63.0 \pm 0.05 \text{ mmHg}$ ) . Fig 5-7.
- Data analysis suggest beneficial impacts of NYSP

## PERSPECTIVES

- National Youth Sports Program until 2005 had over 200 sites throughout the country. Including CWRU, Toledo, Cleveland State, OSU, OU, Kent, Youngstown, Wittenberg, and even UD. Today, there are about 70 due to budget cuts.
- There were confounding variables that cannot be controlled or accounted for including but not limited to:
  - Duration of the camp
  - Participation in each athletic activity
  - Level of activity after the camp day
  - Daily energy consumption
- Further studies with standardized and more controlled environment as well as additional health related measurements would allow for more comprehensive analysis on the impact of the sports camp on improvements in overall health.

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## ACKNOWLEDGEMENTS

Thank you to the administrative staff at NYSP-CWRU as well as Dr. Anne Crecelius and Dr. Lloyd Laubach for your continued support in this project.